

<p>2.03 Investigate and analyze the cell as a living system including:</p> <ul style="list-style-type: none"> • Maintenance of homeostasis. • Movement of materials into and out of cells. • Energy use and release in biochemical reactions. 	<ul style="list-style-type: none"> • Examples for exploration should include regulation of temperature, pH, blood glucose levels and water balance. • Discussion should include active vs. passive transport, diffusion, osmosis, and the porous nature of the semi-permeable plasma membrane. (<i>Pinocytosis, phagocytosis, endocytosis, and exocytosis have been deliberately excluded</i>) • Given different types of cells, students should be able to predict any changes in osmotic pressure that may occur as the cell is placed in solutions of differing concentrations. (<i>Emphasis is on the processes, not terminology such as hypertonic, isotonic, hypotonic, turgor pressure</i>) • Examine ATP as the source of energy for cell activities. • Students will describe how cells store and use energy with ATP and ADP molecules. 	<p>An osmosis lab / diffusion lab</p> <p>Inquiry Support Activities: Osmosis and the Egg How do biological materials respond to acids and bases? (Buffer lab)</p> <p>Activities that demonstrate when food is burned energy is given off (such as burning a peanut or cheese doodle)</p>
<p>2.04 Investigate and describe the structure and function of enzymes and explain their importance in biological systems.</p>	<p>Instruction should include investigation of:</p> <ul style="list-style-type: none"> • Enzymes as proteins that speed up chemical reactions (catalyst). • Enzymes as re-usable and specific. • Enzymes as affected by such factors as pH, and temperature. <p>Students should understand that enzymes are necessary for all biochemical reactions and have a general understanding of how enzymes work.</p>	<p>Inquiry Support Activity: Properties of Enzymes</p>
<p>2.05 Investigate and analyze the bioenergetic reactions:</p> <ul style="list-style-type: none"> • Aerobic respiration • Anaerobic respiration • Photosynthesis 	<p>The emphasis should be placed on investigation of:</p> <ul style="list-style-type: none"> • Overall equations including reactants and products and not on memorizing intermediate steps of these processes. • Factors which affect rate of photosynthesis and or cellular respiration. • Comparison and contrast of these processes with regard to efficiency of ATP formation, the types of organisms using these processes, and the organelles involved. <ul style="list-style-type: none"> ○ Anaerobic respiration should include lactic acid and alcoholic fermentation. <p>Instruction should include the comparison of anaerobic and aerobic organisms. (<i>Glycolysis, Kreb's Cycle, and Electron Transport Chain have been deliberately excluded</i>) (<i>Students are not required to distinguish between light dependent and light independent parts of photosynthesis</i>)</p>	<p>Inquiry Support Activity: Yeast Fermentation</p> <p>Inquiry activities which allow students to investigate factors affecting rate of photosynthesis and/or cellular respiration</p>